No. 829,314. PATENTED AUG. 21, 1906.

V. D. ANDERSON, DEC'D.

A. D. ANDERSON, EXECUTOR.

PRESS.

APPLICATION FILED JULY 1, 1903. 5 SHEETS—SHEET 1.

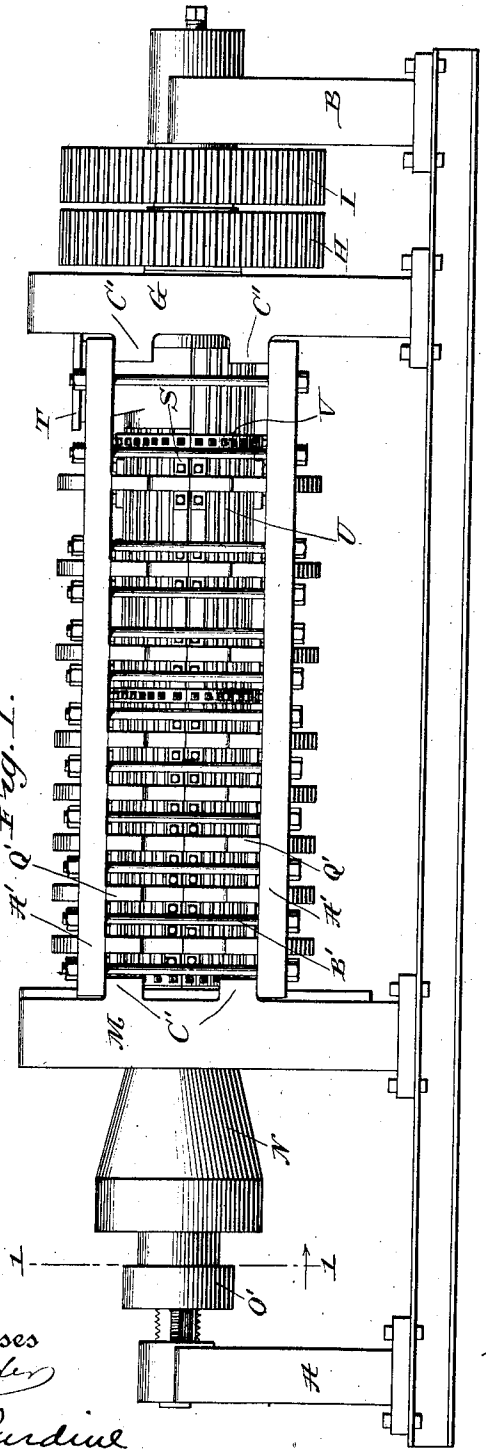

Fig. 1.

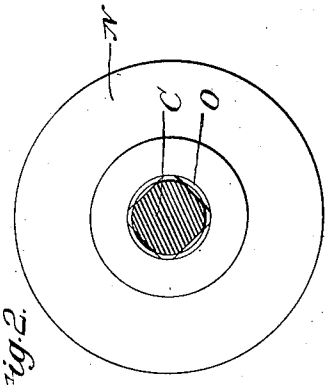

Fig. 2.

Witnesses
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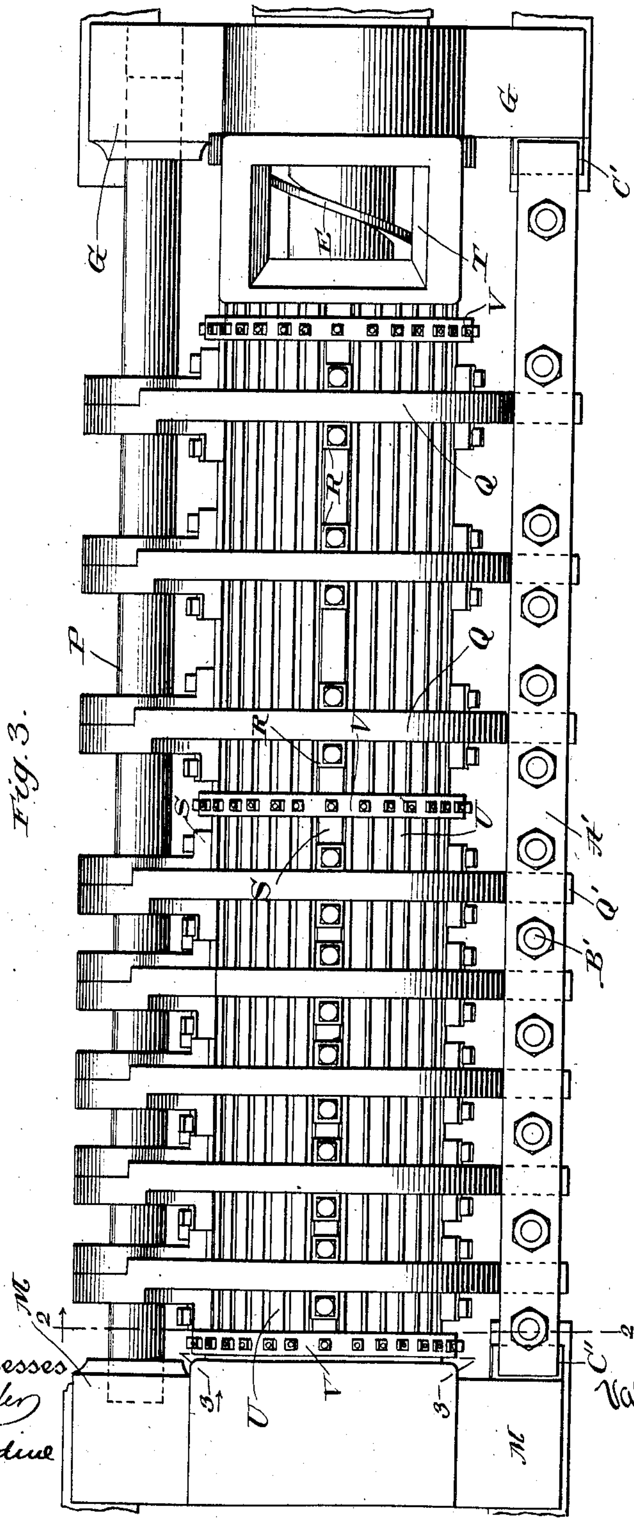

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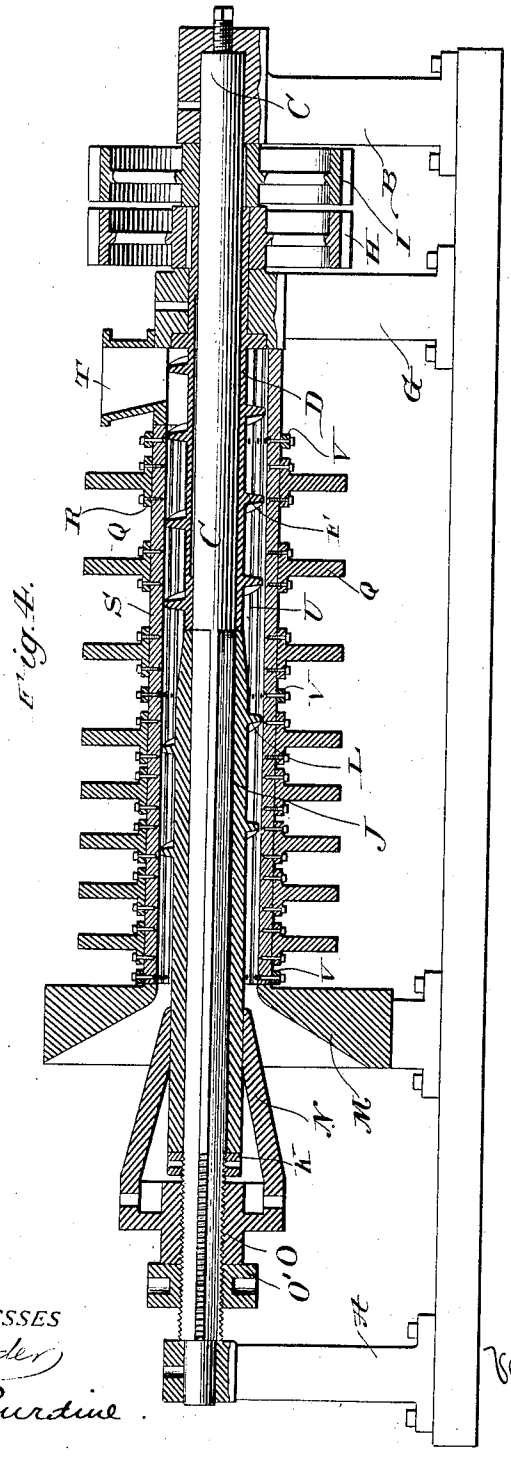

Fig. 4.

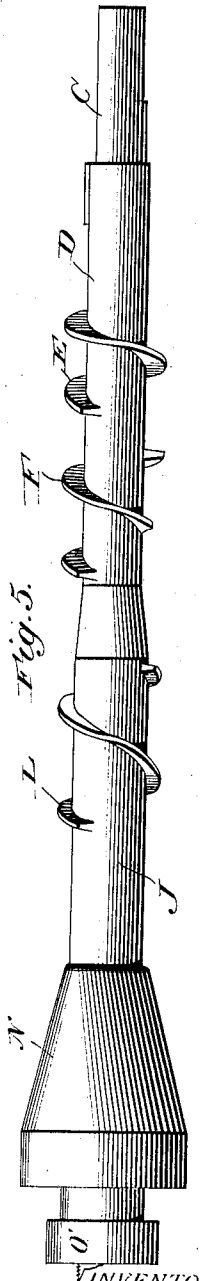

Fig. 5.

WITNESSES

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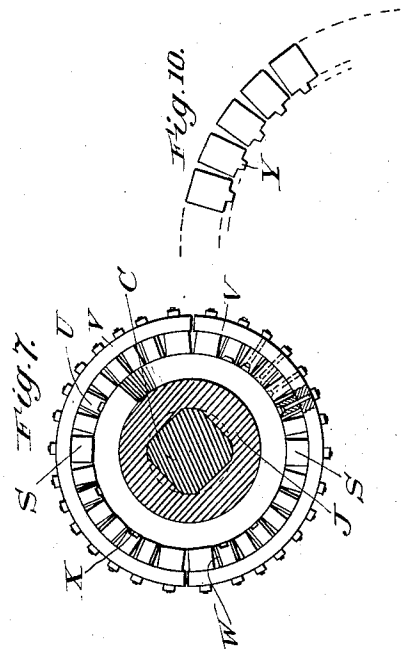

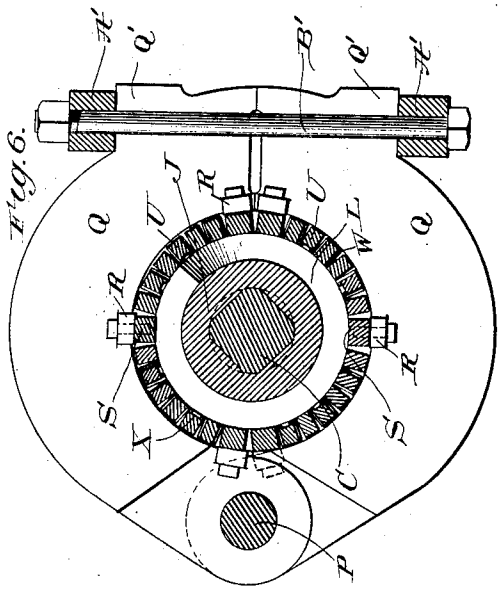

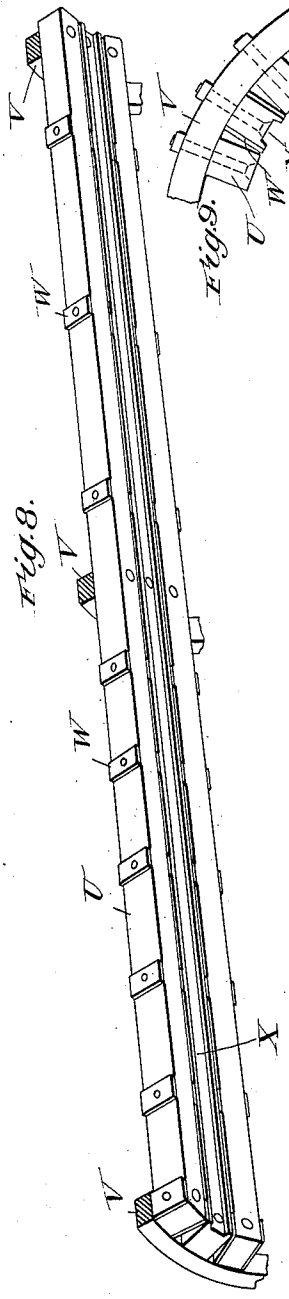

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PRESS.

APPLICATION FILED JULY 1, 1903.

5 SHEETS—SHEET 5.

Fig. 11.

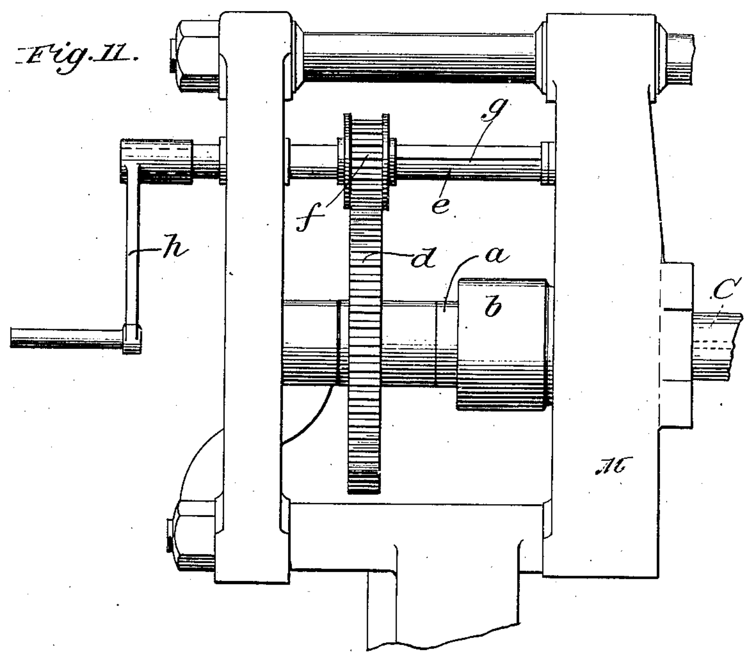
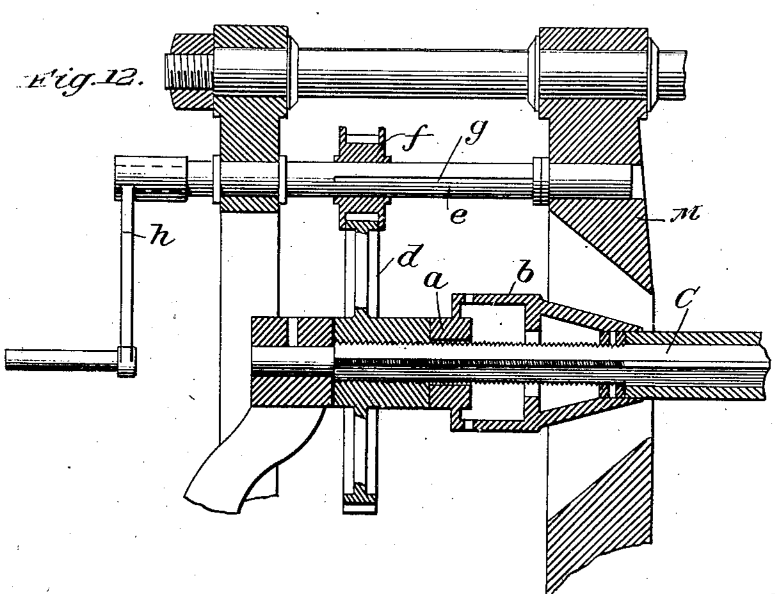


Fig. 12.



Witnesses
[illegible]
D. E. Burdine

Inventor:
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UNITED STATES PATENT OFFICE.

VALERIUS D. ANDERSON, OF CLEVELAND, OHIO; ALBERT D. ANDERSON EXECUTOR OF SAID VALERIUS D. ANDERSON, DECEASED.

PRESS.

No. 829,314. Specification of Letters Patent. Patented Aug. 21, 1906.

Application filed July 1, 1903. Serial No. 163,945.

To all whom it may concern:

Be it known that I, VALERIUS D. ANDERSON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Presses, of which the following is a specification.

My present invention pertains to improvements in presses, the construction and advantages of which will be hereinafter set forth, reference being had to the annexed drawings, wherein—

Figure 1 is a side elevation of the press; Fig. 2, a sectional view, on an enlarged scale, taken on the line 1 1 of Fig. 1; Fig. 3, a top plan view of the press; Fig. 4, a longitudinal sectional view of the same; Fig. 5, a side elevation of the compressing mechanism; Fig. 6, a sectional view on the line 2 2, Fig. 3; Fig. 7, a similar view on the line 3 3, Fig. 3; Fig. 8, a perspective view of a number of the bars employed to form the body or shell of the press; Fig. 9, an end view thereof; Fig. 10, a view illustrating a modification of the form of bars employed; Fig. 11, a side elevation of a portion of a press, showing a modification of the means employed for adjusting the discharge-plug or disintegrating member; and Fig. 12, a vertical sectional view thereof.

This invention is in a sense an improvement over the presses shown and claimed in my former patents, Nos. 731,734 and 731,737, dated June 23, 1903, to which reference is hereby made.

The main objects of the present invention are, first, to provide means for preventing rotation of the stock within the press as it is forced longitudinally therethrough; second, to provide a simple means for effecting the adjustment of the disintegrating-head or discharge-plug, and, lastly, to so construct the member which carries the final compression screw or screws that, acting with the screw in the feed end of the press, it shall partially extract or force out a portion of the oil from the stock previous to its being given the final compression. The construction by which these objects are attained enables me to treat cotton-seed meal from which the hulls of the seed have been removed and other materials of a similar nature. Where the hulls are absent from the material, it is of too soft a consistency to be satisfactorily treated in the presses hereinbefore referred to. Other advantages of the present construction will appear from the following description.

In the drawings, A B denote suitable standards in which are journaled the ends of a shaft C, said shaft, as will be seen upon reference to Fig. 4, being cylindrical at the head or feed end of the press and polygonal throughout the remaining portion thereof. Surrounding the cylindrical section of the shaft is a quill D, provided with a series of separate and distinct screws E F, any number being permissible in use. The outer end of the quill extends through a standard or frame G and has mounted upon it a gear H, a similar gear I being carried by the shaft C. Continuous motion is imparted to gear I, and consequently to the shaft, while gear H and the attached quill will rotate until a certain pressure is obtained in that portion of the press, when they will come to rest and remain in that condition until the pressure again falls below a predetermined point. This feature forms the subject-matter of the aforesaid applications.

A sleeve J is mounted on the polygonal portion of the shaft C, the interior formation of the sleeve corresponding to the contour of said shaft, so that the sleeve rotates with the shaft at all times. The sleeve is held to its position with reference to the quill by a follower-nut K. As will be seen upon reference to Figs. 4 and 5, the innermost portion of the sleeve, or that immediately adjacent to the quill, is made tapering, the end being of the same diameter as the quill and gradually increasing to the full diameter, which is materially larger than that of the quill.

A screw L is formed upon the sleeve J and serves to force the material under treatment through an opening formed in the standard or frame M and over the tapering disintegrating member or head N. As will be seen, the standard or frame M is made stationary and the opening therein is enlarged in line with the discharge. The disintegrating member N is provided with an interiorly-threaded hub O, which is screwed upon the shaft C, being held from turning by a follower-nut O', likewise carried by the shaft.

Mounted between the standards or frame members G and M is a rod or shaft P, upon which are hinged a series of ribs Q, one set thereof being arranged above and the other below said rod. Each rib is provided with a

series of laterally-extending lugs R, to which are secured by the use of tap-screws or the like relatively heavy bars S, the bars being of such length as to fill the space between the members G and M or the member M and the feed-hopper T, secured to the standard G. A series of smaller bars U is mounted intermediate the bars S, half ring-sections V being bolted to the ends of bars U and also, by preference, at a point intermediate said ends. The bars S are also secured to the ring-sections. To properly space the bars, strips or thin steel plates W are riveted to the opposite faces of each alternate bar or to one side of each, as desired. Some of the bars U are provided with longitudinally-extending grooves or channels X upon their inner faces, as will be seen upon reference to Figs. 6 to 9, inclusive.

The reverse of this construction is shown in Fig. 10, wherein the face of each bar is formed with a projecting rib Y. With either construction grooves or channels will be formed upon the interior face of the shell or barrel, which will effectually prevent rotation of the stock as it passes through the press, but still permit it to be forced lengthwise of the barrel by the screws. Each of the ribs Q is extended outwardly at its free end, as at Q′, and bars A′ are held in contact with said members by bolts B′, thus securely holding the two sections of the shell or barrel together. Lugs C′ C′ also extend laterally from the frame members or standards G and M, being engaged by the locking-bars when the press is closed. These lugs serve to prevent the shell from being twisted and assist in rendering the whole structure rigid throughout.

The operation of the press thus far described is as follows: The material from which the oil is to be extracted—such, for instance, as cotton-seed meal—is introduced into the feed-hopper, motion having been imparted to the quill and the sleeve. The material is given an initial compression in the forward portion of the barrel or shell of the press by the motion of the screws E F, the screw E serving to force it toward the screw F and the material intermediate the screws moving longitudinally in the shell or barrel, but not rotating therein. The ribs or depressions formed in the interior face of the barrel or shell and hereinbefore referred to prevent the rotation of the material in the space intermediate the screws, and consequently it is compacted at this point. Screw F gradually withdraws the compacted material from the space and feeds it forward in the press over the inclined end of the sleeve J, which of course puts it under a higher compression than was obtained in the forward portion of the press. It is from this point on toward the discharge end of the press that the greatest compression takes place, and it will be readily seen that forcing the material from the screw F up over the inclined face of the sleeve J will compress the mass to a great extent. Where hulls are present in the material being treated, it is not necessary to employ this inclined face; but where hulls are absent, as in cotton-seed meal, it becomes essential to first extract part of the oil before giving the final pressure to the material. Otherwise the oil will not separate freely, and a great deal of the solids will be forced out through the slots between the bars. The present construction, however, obviates this difficulty, and the smaller screw or worm upon the sleeve effects the final compression of the material and forces it outwardly through the discharge-opening in the standard M and over the disintegrating member N. As hereinbefore stated, the sleeve with its screw rotates constantly, whereas the quill and its screws or worms rotate until a certain pressure obtains in that portion of the press where the sleeve works, when they will come to a state of rest and remain in such position until the screw L relieves the pressure sufficiently to enable the friction-clutch or other means employed for driving the quill to again rotate the same. It is to be observed that the channels or ribs formed in the interior of the barrel extend throughout the length thereof, so that the material, which is put under great pressure, does not rotate at any point between the screws or worms.

While cotton-seed meal has been referred to specifically, it will be understood that the press is adapted to the treatment of any material from which it is desired to extract the oil. The apparatus shown enables me to express oil from substances which have heretofore not been economically treated, for the reason that no process or means for handling the same was known by which the oil could be successfully extracted.

The construction shown in Figs. 11 and 12 yet remains to be described. Instead of threading the disintegrating head or plug internally the hub *a* of the head *b* is provided with a polygonal opening of a shape to fit upon the corresponding portion of the main shaft C and to rotate therewith. The threaded sections of the shaft do not, however, make contact with the head. Hence the latter may be moved lengthwise of the shaft to adjust or carry its forward tapered end more or less into the inclined discharge-opening formed in the standard M of the press, as heretofore described. Mounted upon the threaded end of the main shaft C in rear of the head or plug *b* is a gear-wheel *d*, the hub of which bears directly against the rear face or hub of the plug. A second shaft *e* is mounted in the frame of the press, said shaft carrying a pinion *f*, which is splined thereto, so that it rotates with the same, the pinion, however, being free to move length-

wise on the shaft by reason of the keyway *g* formed therein.

When it becomes necessary to advance or tighten up the discharge plug or head, a handle *h* is slipped on the end of the small shaft *e*, and by holding said handle stationary while the shaft C is revolving said last-named shaft will screw into the gear, thereby causing it to advance along the shaft and consequently force the plug in toward the barrel of the press. The shrouding of the pinion causes it to move along its shaft as the gear is adjusted along shaft C, the two being thus always held in mesh with each other. When it is desired to slacken up the discharge-plug, the handle is turned in the direction in which the small shaft *e* revolves, although somewhat faster than said shaft, and this carries the spur gear and pinion toward the rear end of the press, the pressure of the stock issuing from the press forcing the plug back along the shaft and maintaining contact between the hub of the gear and said plug. The shafts of the press revolve slowly while it is in operation, which permits the steps just mentioned to be carried out. The pinion, shaft *e*, and the spur-gear revolve at all times when the press is in operation, except when the shaft *e*, and consequently pinion *f*, and the gear are being held against rotation in the act of advancing the head or plug. It is of course manifest that this particular adjusting mechanism may be employed with any form of press of the same general type as that herein described. So, too, the specific form of head shown is not essential to the successful operation of the press. While the sleeve at the discharge end of the press is shown as provided with one screw, it is permissible to use and in practice I have employed a plurality of separated screws at this point.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a perforate shell or casing, a series of separated screws mounted therein; means for imparting motion thereto until a determined pressure is exerted thereby upon the material under treatment, a screw mounted in the discharge end of the shell, said screw being of less depth than those in the forward end thereof; and means for imparting independent positive rotary motion to said screw.

2. In combination with a perforate shell or casing, a series of separated screws mounted therein; means for imparting rotary motion to the screws until a determinate pressure is exerted thereby upon the material under treatment; a screw mounted in the discharge end of the shell, said screw being of less depth than those in the forward end thereof; means for imparting an independent positive rotary motion to said screw; and means for deflecting or spreading the material outwardly toward the shell of the press as it passes from the last of the series of screws to the screw working in the discharge end of the press.

3. In a press, the combination of a perforate shell or casing; a series of separated screws mounted in the feed end thereof; a screw mounted in the opposite end thereof, said screw being of less depth than the separated screws; means intermediate said screws for effecting a compression of the material previous to its being acted upon by said last or discharge screw; and means for imparting a continuous motion to the discharge-screw and permitting the series of screws to come to rest when a determinate pressure is exerted thereon by the material.

4. In a press, the combination of a perforate shell or casing; a series of separated screws mounted in the feed end thereof; a screw mounted in the opposite end thereof, said latter screw being of less depth than the separated screws; an inclined conical member placed intermediate said screws, whereby the material acted upon by the first set of screws is condensed and spread out before being acted upon by the final compression and discharge screw; and means for imparting a continuous motion to the discharge-screw and permitting the series of screws to come to rest when a determinate pressure is exerted thereon by the material.

5. In a press, the combination of a cylindrical perforate shell or casing; a series of separated screws mounted in the forward end thereof; a discharge-screw mounted in the opposite end of the shell or casing, the space intermediate the shell and the screw being less at the discharge end of the press than at the forward end thereof, substantially as described; and means for driving the discharge-screw constantly and the other screws intermittently according as the pressure of the material thereon varies, substantially as described.

6. In a press, the combination of a perforate shell or casing; a shaft extending therethrough; a quill mounted upon said shaft; a series of separated screws carried by said quill; a sleeve also mounted upon the shaft within the shell or casing, the forward end of said sleeve being tapered, substantially as described; a screw carried by said sleeve at a point in rear of the tapered end; and means for imparting a continuous motion to said shaft and an intermittent motion to the quill.

7. In a press, the combination of a perforate shell or casing having grooves or depressions formed upon its interior face and extending longitudinally thereof independent of the draining-spaces formed in the shell; and a series of separated screws mounted within said shell or casing, substantially as and for the purpose described.

8. A shell for a press, comprising a series of bars secured together so as to form draining-

spaces between the adjacent bars, one or more of said bars being provided with means extending longitudinally thereof upon the inner face and substantially throughout its length to prevent rotation of the material undergoing treatment within the shell.

9. A shell for a press, comprising a series of bars secured together so as to form draining-spaces between the adjacent bars, one or more of said bars being provided with grooves or channels extending longitudinally thereof substantially throughout its entire length, said grooves or channels serving to prevent rotation of the material within the shell, substantially as described.

10. In a press, the combination of a perforate shell or casing; a series of separated screws mounted therein; and means for preventing the rotation of the material intermediate the separated screws.

11. A shell or barrel for presses, comprising a series of hinged ribs; a series of bars secured to said ribs; a second series of bars; and ring-shaped members secured to both sets of bars, substantially as described.

12. In a press, the combination of a suitable frame; a rod secured in said frame; a series of ribs hinged upon said rod; a series of bars secured to said ribs and adapted when the latter are brought together to form the shell or barrel of the press; projections extending outwardly from said ribs; lugs extending from the frame of the press; locking-bars arranged to bear upon said lugs and the projections of the ribs; and means for securing said locking-bars in position.

13. In a press, the combination of a suitable frame; a rod carried thereby; a series of ribs hinged to said rod, said ribs being provided with laterally-extending lugs R; a series of bars S secured to said lugs; a series of bars U placed intermediate the bars S; ring-shaped members attached to said bars S and U; and means for securing the ribs in their closed position.

14. A member for the barrel or shell of a press, comprising a bar having a series of spacing strips or plates riveted to the side faces thereof.

15. A member for the barrel or shell of a press, comprising a bar having spacing-strips riveted to the opposite side faces thereof.

16. In a press, the combination of a perforate shell or casing; a series of separated screws mounted in the forward end thereof; a discharge-screw working in the opposite end of the shell; an inclined bearing-face located intermediate the series of screws and the discharge-screws, serving to condense and spread out the material under treatment, substantially as described; and means for imparting a continuous motion to the discharge-screw and permitting the series of screws to come to rest when a determinate pressure is exerted thereon by the material.

17. In combination with the shaft of a press, a head or plug located at the discharge end thereof, mounted on and rotatable with said shaft; a follower mounted upon the threaded end of the shaft in rear of said head; and means for arresting the rotation of said follower and thereby causing it to advance upon the shaft, whereby the head or plug will be moved inwardly, substantially as described.

18. In combination with the main shaft of a press, a head or plug located at the discharge end thereof, mounted and longitudinally movable on said shaft; a gear carried by the threaded section of the shaft in rear of said head; a second shaft; a pinion splined upon said second shaft and meshing with the gear; and means for holding said second shaft against rotation or for imparting to it a speed of rotation in excess of that of the main shaft.

19. In combination with the main shaft of a press, a head or plug mounted thereon, said plug rotating with the shaft and being free to move longitudinally thereof; a gear mounted upon the threaded portion of the shaft in rear of the head; a shaft *e* having an extended keyway formed therein; a shrouded pinion splined upon said shaft; and means applied to said shaft for arresting or increasing the speed of rotation thereof, substantially as and for the purpose described.

20. In combination with a perforate shell or casing, a series of separated screws mounted in the forward end thereof; means for imparting intermittent motion thereto; a series of screws mounted in the discharge end of the shell, said screws being of less depth than those in the forward end thereof; and means for imparting independent positive rotary motion thereto.

21. In combination with a perforate shell or casing, means contained within the forward end thereof for compressing the material undergoing treatment; independent means mounted in the discharge portion of the shell for further compressing and discharging the mass, said last-named means having a relatively restricted working area immediately adjacent to the inner surface of the shell, substantially as described, and a disintegrator working adjacent to the discharging means.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

VALERIUS D. ANDERSON.

Witnesses:
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E. PENDLETON, Jr.